Charge to “researchers’ group” (from spring *SAMS the Sequel* meeting:

**“Develop succinct conceptual briefs around core areas (building from the attributes list) that can inform and be linked to the “high-leverage” practices work”**

**Task Categories with Links to “Productive Persistence” Drivers**

**Social Psychological-Interventions**: These tasks are intended to shape student’s academic identity; bolster student motivation; broaden students’ perceptions of what it means to be a successful mathematics learner; or to mitigate the negative effects of, for example, stereotype threat

* **Identity**
* **Beliefs about math, competence, knowledge (clarity of purpose; relevance)**
* **Agency (engagement; taking responsibility for learning)**

**Metacognitive Interventions**: These tasks are intended to enhance students’ ability to be effective learners. (need to flesh out).

* **Self-regulated learning**
* **Emotion regulation**

**Community of learners**: These tasks are intended to create safe spaces for students to take risks, etc. (need to flesh out)

* **Encouraging risk-taking**
* **Making (and learning from) mistakes (“grit”? “resilience”?)**

**[How/where does “multiple ways of demonstrating competence within mathematics” fit, or is it a distinct area of intervention?]**

**Student Attributes from College Readiness Math Standards**

1. **Demonstrating intellectual engagement**

Students should perceive mathematics as a way of understanding the world, not just a sequence of algorithms to be memorized and applied. They should actively explore new ideas, posing questions about their meaning, significance, and implications; recognize patterns – as well as deviations from previously learned patterns – in data, diagrams, symbols, and words; and most importantly, be willing to take risks and be challenged as part of the learning process. Contributing to group problem-solving activities, and benefiting from them, is part of that challenge.

1. **Taking responsibility for learning**

If achievement in college has a secret, it might be effective time management. Budgeting the time necessary to be successful involves, above all, attending class regularly and preparing the work assigned conscientiously. In addition, the willingness to examine and learn from one’s own mistakes is essential; to that end, students should be aware of the numerous resources available for support on most college campuses, including math labs, tutoring services, and class notes and supplementary material often posted on the web.

1. **Persevering when faced with time-consuming or complex tasks**

Few attributes are more important for success in college work than patience and perseverance. Mathematical problems often involve tasks that require organizing and implementing multiple steps, concepts, or techniques; students need to realize that previously seen examples won’t usually generate adequate answers to these sorts of problems and employ the time and thought that will. Often, this involves the willingness to modify unproductive approaches or change them altogether, effort that’s more than repaid when the correct answer is obtained.

1. **Paying attention to detail**

Adopting inadequate methods usually means obtaining faulty results; errors are unavoidable, but students should try to minimize them by correctly following all parts of oral and written directions without needing additional reminders, and developing the habit of checking and re-checking their work so as to minimize notational errors (*e.g.,* the accidental transposition of digits, the dropping or altering of algebraic symbols, and/or the incorrect positioning of points on a grid).

**Common Core State Standards for Mathematics: Standards for Mathematical Practice**

1 Make sense of problems and persevere in solving them.

2 Reason abstractly and quantitatively.

3 Construct viable arguments and critique the reasoning of others.

4 Model with mathematics.

5 Use appropriate tools strategically.

6 Attend to precision.

7 Look for and make use of structure.

8 Look for and express regularity in repeated reasoning.

**PISA (Programme in International Student Assessment) Self-Regulated Learning Assessment**

Four global components of SRL, each with subcomponents totaling 13 in number:

* cognitive and metacognitive learning strategies (including memorization, elaboration, and control strategies);
* motivation and interest (including instrumental motivation, interest in reading and mathematics, and effort and perseverance);
* self-concept (including perceived self-efficacy, self concept in reading and mathematics, and academic self concept); and
* reference for learning situations (including cooperative and competitive learning)